



Hydrologic response to climate change and human activities in a subtropical coastal watershed of southeast China

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Abstract:

It is essential to investigate hydrologic responses to climate change and human activities across different physiographic regions so as to formulate sound strategies for water resource management. Mann-Kendall, wavelet and geospatial analyses were coupled in this study, associated with ENSO indicators, flashiness index and baseflow index, in order to explore the hydrologic sensitivity to climate change and human activities in the Jiulong River Basin (JRB), a subtropical coastal watershed of southeast China. The results showed that the average annual precipitation presented an increasing trend (Z Euro Surveillance (Bulletin Europeen Sur Les Maladies Transmissibles; European Communicable Disease Bulletin) 2.263, p Euro Surveillance (Bulletin Europeen Sur Les Maladies Transmissibles; European Communicable Disease Bulletin) 0.024) and that this tendency has become weaker from estuary to inland in the JRB over the past 50 years. The annual frequency of rainstorm events increased from 3.4 to 5.2 days in the estuary and from 5.1 to 5.6 days in the West River, whereas it decreased from 6.0 to 5.5 days in the North River from 1954 to 2010. The 10-year average streamflow during 2001-2010 in the North River and West River decreased by 9.2 and 6.7 %, respectively, compared to the average annual streamflow during 1967-2000. Annual fluctuations were the most representative signals in streamflow variability for the North River and West River over the period 1967-2010. Human activities including dam construction, land change and socioeconomic development posed increasing influences on hydrologic conditions in the JRB. Seasonal variability of streamflow and sediment discharge changed significantly between the two periods divided by the jumping point (1992), identified when dams were constructed extensively in the North River and West River. This research provided important insights into the hydrologic consequences of climate change and human activities in a subtropical coastal watershed of southeast China.

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Resource Description

Exposure :

weather or climate related pathway by which climate change affects health

Food/Water Security

Geographic Feature:

resource focuses on specific type of geography

Freshwater, Ocean/Coastal, Other Geographical Feature

Other Geographical Feature : Subtropical

Geographic Location: ☒

resource focuses on specific location

Non-United States

Non-United States: Asia

Asian Region/Country: China

Health Impact: ☒

specification of health effect or disease related to climate change exposure

Health Outcome Unspecified

Mitigation/Adaptation: ☒

mitigation or adaptation strategy is a focus of resource

Adaptation

Resource Type: ☒

format or standard characteristic of resource

Research Article

Timescale: ☒

time period studied

Time Scale Unspecified

Vulnerability/Impact Assessment: ☒

resource focus on process of identifying, quantifying, and prioritizing vulnerabilities in a system

A focus of content